Volunteer Lake Assessment Program Individual Lake Reports

PEMIGEWASSET LAKE, MEREDITH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	3,328	**Max. Depth (m):**	8.8	**Flushing Rate (yr^{1})**	2.8
Surface Area (Ac.):	241	**Mean Depth (m):**	2.4	**P Retention Coef:**	0.61
Shore Length (m):	6,100	**Volume (m^{3}):**	2,329,500	**Elevation (ft):**	559

TROPHIC CLASSIFICATION

Year	Trophic class
1980	MESOTROPHIC
1993	MESOTROPHIC

KNOWN EXOTIC SPECIES

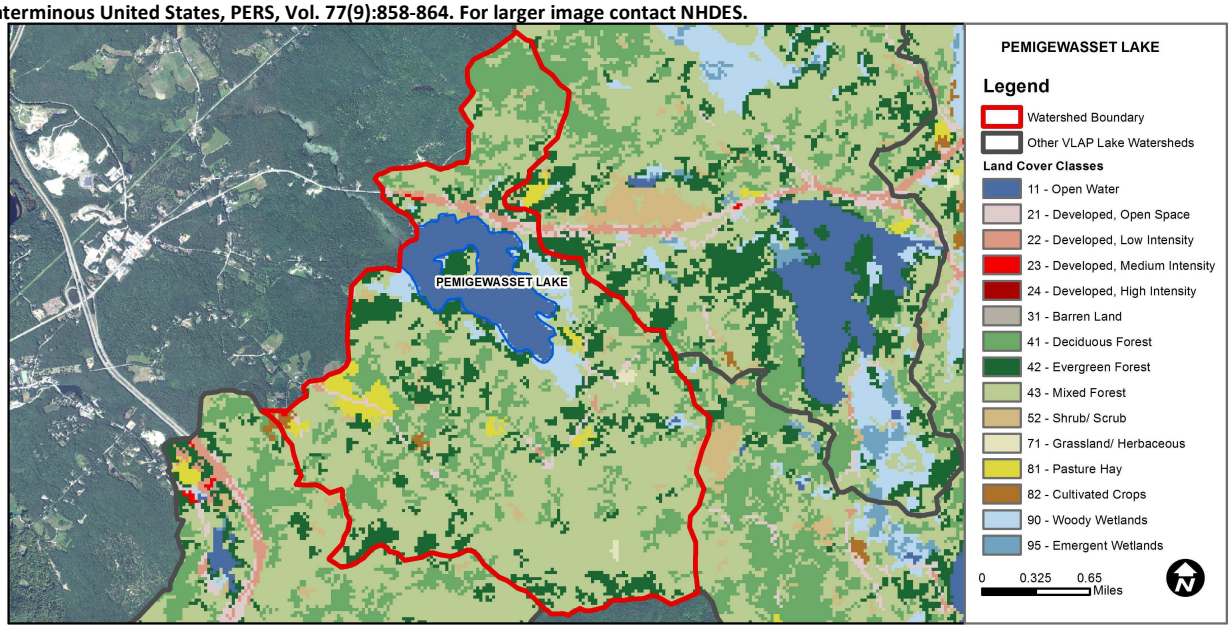
Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Encouraging	< 10 samples and no exceedance of criteria. More data needed.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.08	Barren Land	0	Grassland/Herbaceous	0.25
Developed-Open Space	1.36	Deciduous Forest	15.75	Pasture Hay	2.13
Developed-Low Intensity	0.81	Evergreen Forest	13.15	Cultivated Crops	0.28
Developed-Medium Intensity	0.08	Mixed Forest	53.88	Woody Wetlands	3.29
Developed-High Intensity	0	Shrub-Scrub	0.94	Emergent Wetlands	0.03

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PEMIGEWASSET LAKE, MEREDITH, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were low and less than the state median. Visual inspection of historical data indicates relatively stable chlorophyll levels.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride were approximately equal to the state medians. Visual inspection of historical data indicates relatively stable epilimnetic (upper water layer) conductivity.
- **E. COLI:** E. coli levels were much less than state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic and metalimnetic (middle water layer) phosphorus levels were low and much less than the state median. Visual inspection of historical data indicates stable epilimnetic phosphorus since monitoring began. Hypolimnetic (lower water layer) phosphorus levels were elevated and the turbidity was also elevated indicating either bottom sediment contamination and/or the accumulation of organic compounds released from bottom sediments when dissolved oxygen levels decrease below 1.0 mg/L. Inlet and Outlet phosphorus levels were low.
- **TRANSPARENCY:** Transparency improved from 2012 and was the highest measured since monitoring began. Visual inspection of historical data indicates stable transparency since monitoring began.
- **TURBIDITY:** Turbidity was low at all stations except for the hypolimnion. When dissolved oxygen levels decrease to less than 1.0 mg/L phosphorus and other organic compounds may be released from bottom sediments causing turbid hypolimnion conditions.
- **PH:** Metalimnetic and hypolimnetic pH levels were less than desirable range 6.5 – 8.0 units. Visual inspection of historical data indicates highly variable epilimnetic pH.
- **RECOMMENDED ACTIONS:** Increase monitoring frequency to three times per summer, typically June, July and August, to better assess seasonal and historical water quality and decrease data variability. Keep up the great work!

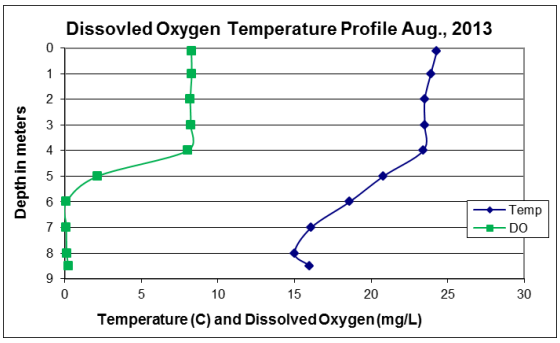


Table 1. 2013 Average Water Quality Data for PEMIGEWASSET LAKE

Station Name	Alk.	Chlor-a	Chloride	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	#/100ml	ug/l	m		ntu	
							NVS	VS		
Boat Launch					10					
Epilimnion	4.20	3.06	6	45.1		5	5.20	5.70	0.36	6.62
Metalimnion				45.4		8			0.40	6.14
Hypolimnion				55.2		23			11.15	6.13
Inlet 1			6	45.0		5			0.24	6.66
Inlet 2			6	45.5		6			0.35	6.53
Outlet			7	45.1		5			0.25	6.57
Smoke Rise Cove					10					

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.